

What is claimed is:

1.

A catalyst system for a motor vehicle having an engine with an exhaust port that carries exhaust gases away from the combustion chamber of the engine, the exhaust gases leave the combustion chamber and flow in a downstream direction by first entering the exhaust port, said catalyst system comprising:

a conically shaped catalyst;

a main brick catalyst having an angled front face disposed downstream of said conically shaped catalyst.

2.

The catalyst system as set forth in claim 1, wherein said conically shaped catalyst is disposed adjacent to the exhaust port of the engine.

3.

The catalyst system as set forth in claim 2, wherein said conically shaped catalyst includes a rear face disposed at an angle from said angled front face of said main brick catalyst.

4.

The catalyst system as set forth in claim 3, wherein said angle between said rear face of said conically shaped catalyst and said angled front face of said main brick catalyst is acute.

5.

The catalyst system as set forth in claim 4, wherein said conically shaped catalyst includes cells having a cross sectional area, said cross sectional area of at least one of said cells of said conically shaped catalyst increases in the downstream direction.

6. The catalyst system as set forth in claim 5, wherein said conically shaped catalyst includes a metallic substrate.

5 7. The catalyst system as set forth in claim 5, wherein said main catalyst brick includes cells of a constant cross sectional area.

8. The catalyst system as set forth in claim 7, wherein said main brick catalyst includes a ceramic substrate.

10

9. The catalyst system as set forth in claim 5, further comprising a shell enclosing said main brick catalyst and having a downstream end, said shell includes an exit portion having a diameter formed on said downstream end thereof, said exit portion decreases in diameter in the downstream direction.

15

10. The catalyst system as set forth in claim 9, wherein said main brick catalyst includes a downstream end having a conically shaped formation having a diameter, said diameter of said conically shaped formation decreases in the downstream direction at a rate greater than the rate at which said exit portion of said shell decreases in diameter in the downstream direction.

20

25

11.

A catalyst system for a motor vehicle having an engine with a plurality of exhaust ports that carry exhaust gases away from the combustion chamber of the engine, the exhaust gases leave the combustion chamber and flow in a downstream direction by first entering the exhaust ports, said catalyst system comprising:

5

a plurality of conically shaped catalysts disposed adjacent to the exhaust ports;

a main brick catalyst having a front face that includes a plurality of angled surfaces disposed downstream of said conically shaped catalyst.

10

12.

The catalyst system as set forth in claim 11, wherein said main brick catalyst includes a surface substantially parallel to the exhaust gas flow through said main brick catalyst that interconnects at least two of said plurality of angled surfaces.

15

13.

The catalyst system as set forth in claim 12, wherein said conically shaped catalyst includes a rear face that is substantially parallel to one of said plurality of angled surface of said main brick catalyst.

20

14.

The catalyst system as set forth in claim 13, wherein at least one of said plurality of conically shaped catalyst is disposed adjacent to one of the exhaust ports of the engine.

15.

The catalyst system as set forth in claim 11, wherein said conically shaped catalyst includes cells having a cross sectional area, said cross sectional area of at least one of said cells of said conically shaped catalyst increases in the downstream direction.

5

16.

The catalyst system as set forth in claim 15, wherein said conically shaped catalyst includes a metallic substrate.

17.

The catalyst system as set forth in claim 16, wherein said main catalyst brick includes cells of a constant cross sectional area.

10

18.

The catalyst system as set forth in claim 17, wherein said main brick catalyst includes a ceramic substrate.

15

19.

The catalyst system as set forth in claim 11, further comprising a shell enclosing said main brick catalyst and having a downstream end, said shell includes an exit portion having a diameter formed on said downstream end thereof, said exit portion decreases in diameter in the downstream direction.

20

25

20.

The catalyst system as set forth in claim 19, wherein said main brick catalyst includes a downstream end having a conically shaped formation having a diameter, said diameter of said conically shaped formation decreases in the downstream direction at a rate greater than the rate at which said exit portion of said shell decreases in diameter in the downstream direction.

10

15

20

25

21.

A catalyst system for a motor vehicle having an engine with a plurality of exhaust ports that carry exhaust gases from the combustion chamber of the engine, the exhaust gases leave the combustion chamber and flow in a downstream direction by first entering the exhaust ports, said catalyst system comprising:

a plurality of conically shaped catalyst disposed adjacent to the plurality of exhaust ports, said conically shaped catalysts have a front face and a rear face, said rear face being larger than said front face, said conically shaped catalysts also include cells that vary in size, said cell size increasing in the downstream direction, said plurality of conically shaped catalysts include a metal substrate;

a shell that includes a plurality of tubes extending therefrom, said plurality of tubes receive said plurality of conically shaped catalysts, said shell includes an exit portion that decreases in diameter in the downstream direction;

a main brick catalyst disposed within said shell, said main brick catalyst is substantially cylindrical in shape and disposed downstream from said plurality of conically shaped catalysts, said main brick includes an angled front face and a downstream end, said downstream end has a conically shaped formation that decreases in diameter in the downstream direction at a rate greater than the rate at which said exit portion of said shell decreases in the downstream direction, said main catalyst brick includes a ceramic substrate; and

an exhaust pipe attached to said exit portion of said shell.

22. The catalyst system as set forth in claim 22, wherein said main brick catalyst includes a plurality of angled surfaces interconnected by at least one surface parallel to the exhaust gas flow through said main catalyst brick.

5

10

15

20

25